

## TECHNICAL REFERENCE DOCUMENT: SOLDERING

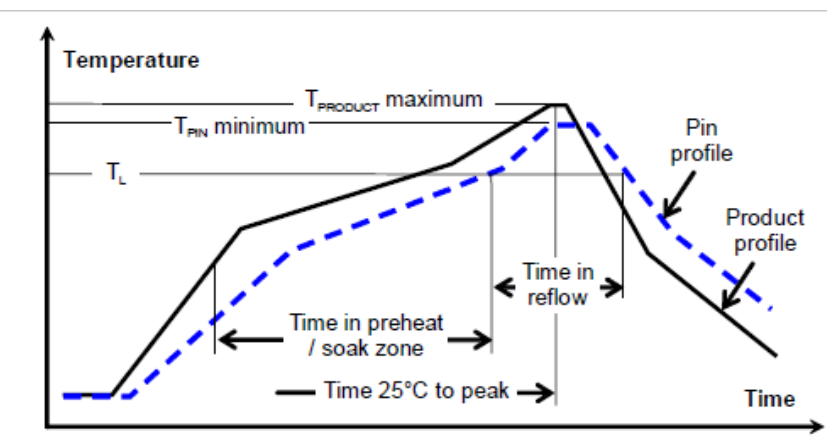
### Reflow soldering profile for surface mount

Products intended for surface mount assembly are qualified for use in a Pb-free forced convection or vapor phase reflow soldering process.

For Pb-free solder processes, a pin temperature ( $T_{pin}$ ) in excess of the solder melting temperature ( $T_L$ , 217 to 221°C for SnAgCu solder alloys) for more than 60 seconds and a peak temperature of 245°C on all pins is recommended to ensure a reliable solder joint.

$T_L$  is the typical solder melting (liquidous) temperature  
 $T_{product}$  is measured on the power module's hotspot  
 $T_{pin}$  is measured on the power module output power pins solder joints at the customer board

| General reflow process specification   |               | Pb-free, SAC305 |
|--|---------------|-----------------|
| Average ramp-up rate ( $T_{product}$ ) |               | 3 °C/s max      |
| Typical solder melting temp.           | $T_L$         | 217 °C          |
| Min/Max. reflow time above $T_L$       | $T_{pin}$     | 60 –150 s       |
| Min. pin temp.                         | $T_{pin}$     | 235 °C          |
| Peak product temp.                     | $T_{product}$ | 245 °C          |
| Average ramp-down ( $T_{product}$ )    |               | 6°C/s max       |
| Max. time 25° C to peak                |               | 8 minutes       |



Typical soldering profile

## Moisture reflow classification

For Pb-free reflow solder processes, the product is qualified for MSL 3 according to IPC/JEDEC standard J-STD-020C.

## Dry pack information

Using products in high temperature reflow soldering processes requires dry pack storage and handling. Products intended for Pb-free reflow soldering processes are delivered in standard moisture barrier bags according to IPC/JEDEC standard J-STD-033 (handling, packing, shipping and use of moisture/reflow sensitivity surface mount devices). In case the products have been stored in an uncontrolled environment and no longer can be considered dry, floor life according to MSL 3, the modules must be baked according to J-STD-033.

## Post solder cleaning

A no-clean flux is recommended to avoid entrapment of cleaning fluids in cavities inside the product or between the product and the host board, since cleaning residues may affect long term reliability and isolation voltage.